REMARKS

This is in response to the Office Action dated July 17, 2006. A request for a one month extension of time and the required fee are submitted herewith.

The Examiner has rejected nearly all of the pending claims as anticipated by United States Patent No. 5,373,964 to Moore or German Patent DE 1063755 to Sattler or United States Patent No. 5,226,568 to Newton. Claims 9 and 27 were rejected under § 103 based on Moore or Sattler in view of Mackal. Applicant has amended the claims to specify that there be at least one passage in the restriction device which has a smaller diameter than the diameter of the intake opening. The claims as amended further say that this passage is sized and positioned so that the liquid to be dispensed enters the discharge channel at a selected pressure which is independent of any pressure exerted on the liquids in the container.[1] None of the cited references teach or suggest this structure or any structure which can achieve this result. For that reason, the claims are patentable over the cited references.

Certain regulations, particularly European regulations on medicinal products, specify that the maximum rate of dispensing of drops from a dispenser must not exceed two drops per second to ensure countability. In other words, while the volume of the drops can be adjusted to the producer's demand, e.g. depending on the medicinal product, the rate should be consistent independent of the pressure imposed upon the dispenser.

The inventor discovered that in order to make sure that the size of the drops is constant independent of the pressure exerted, a restrictor device has to be disposed upstream of the intake opening of the discharge channel and, thus, to provide an intermediate chamber downstream the

[1] Support for this amendment can be found at pages 4-5, page 7, lines 3-6 and page 9, lines 11-19 of the specification.

restrictor device forming a buffer. That chamber decouples the pressure on the liquids in the chamber from the pressure imposed upon the container. In order to archive that objective, the diameter of the passage bore in the restrictor device typically is in the range of 0.1 mm to 0.25 mm. Such bore is hardly visible to the naked eye and even a considerable pressure exerted upon the container will only create a very thin stream of liquid passing through the restrictor. That stream will not be able to establish a significant pressure rise in the intermediate chamber.

Next, the inventor discovered, that it has to be avoided that such stream of liquid directly enters the intake opening which might interfere with a uniform drop formation. Therefore, he teaches arranging the restrictor device at a distance away from the intake opening in order to reduce the probability of the stream entering the intake opening. Alternatively, the passage opening could be offset relative to the intake opening.

When the user operates the container he expects that it comes, without considerably delay, to a drop formation at the tip and a drop withdrawal from the container. That requires the entire volume behind the restrictor device to be filled with liquid. Since the restrictor device for the reasons outlined above has to be small, this volume should be as small as possible but at least equal to the volume of the discharge channel. Furthermore, the droplet size should be as exact as possible while not so small that the user does not have to count too large numbers of drops. In practice this leads to the fact that the withdrawal opening (discharge opening 25) typically has a diameter of 2.8 mm to 7 mm and preferably of 4 mm to 7 mm. However, a cylindrical discharge channel with a constant cross section at a caliber of 4 mm to 7 mm leads to substantial fluctuations of the droplet size and to the fact that the dispensing rate exceeds the above mentioned limit. Thus, compared to the diameter of the withdrawal opening the intake opening

must be smaller in order to constrict the discharge channel and for achievement of a sufficient dosing exactness. The constriction according to the invention is achieved by the bottom wall which separates the volume of the intermediate chamber wall from the volume of the discharge channel. Dosing exactness can be further improved by a continuous widening of the discharge channel as shown in the figures generating a laminar flow from a smaller intake opening to a larger withdrawal opening. In this regard new claims 33 to 38 are introduced.

In light of the above, the newly cited reference United States Patent No. 5,373,964 cannot be considered to anticipate the present invention. Moore aims at a totally different objective, namely, to align the droplet with the eye when dispensing the liquid. For that purpose, Moore teaches to center the pinhole axis so that it forms a viewable target lying in the focal plane of a drop formed on the tip of the dispensing nozzle. And although in claim 4, lines 49-53 Moore recognizes that a narrow diameter of the pinhole controls the flow of the liquid through the outlet, he does not teach to choose the diameter of the pinhole such that the pressure in the intermediate chamber is definitely independent of the pressure exerted on the container. Needless to say that a hole which is visible to the eye is not small enough to assure properly decoupled chambers with respect to the pressure. Furthermore, Moore does not suggest to arrange the pinhole such that a stream of liquid directly passing the pinhole cannot directly enter the outlet opening.

Essentially the same discussion applies to the newly cited reference United States Patent No. 5,226,568 to Newton et al. This patent discloses a container for dispensing sterile solutions for cleaning contact lenses. In order to avoid contamination of the solution, it must not come into contact with the air. The objective of Newton accordingly is to provide a container that

allows the fluid to leave the container but prevents air from being sucked back into the container. For that purpose, the container includes a retaining ring 14 comprising a nozzle member 33 which is in sealing contact with a tapered portion 28 of a valve stem 25. Upon applying a pressure to the body portion sufficiently to overcome the circumferential grip between the nozzle member 33 and tapered portion 28, the fluid can flow from within the container through the outlet. Thus, the flow rate out of the container along the flow path between the nozzle member 33 and tapered portion 28 is proportional to the amount of external pressure applied to the container, see column 4, lines 12-15. Accordingly, Newton clearly teaches away from the core of the present invention. Further, from a functional point of view, the passage between the tapered portion 28 and the nozzle member 33 can be compared to the restrictor device of the present invention. Then, however, Newton's dispenser does not provide an intermediate chamber.

Mackal discloses a plurality of passage openings 27 being offset to an intake opening 24. However, this is only an accidental conformity of features. The dispenser according to Mackal requires a plurality of openings 27 in order to make sure that enough liquid can travel through the plunger disc 26 into the activity 22 without increasing the cross section of the openings too much so that a uniform pressure can be exerted by the plunger disc 26. Furthermore, imposing pressure upon the container causes the plunger disc 26 to be thrust in an outward direction reducing the volume of cavity 22 and, thus, directly transfers the pressure to the cavity. Thus, Mackal, as well, teaches away from the object of the present invention.

German reference DE 1063755 to Sattler fails to disclose an intermediate chamber and a bottom wall which together with the chamber wall physically forms the intermediate chamber

and separates the volume of the intermediate chamber from the volume of the discharge channel. Sattler rather teaches to provide behind the restrictor a seamless volume including the discharge channel.

Even when viewed together the cited references fail to teach or suggest a dropper cap or container in which the pressure exerted on the liquids in the container does not directly affect the pressure at which the liquids enter the discharge opening. Indeed, the combined teaching of the references is directed away from the claimed invention. Therefore, the claims as amended are patentable under both sections 102 and 103. Reconsideration and allowance are respectfully requested.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Lynn J. Alstadt
Registration No. 29,362
BUCHANAN INGERSOLL, P.C.
One Oxford Centre
301 Grant Street
Pittsburgh, Pennsylvania 15219

Attorney for Applicant

(412) 562-1632